

5 **WHAT IS CLAIMED:**

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1 For a factory process comprising a plurality of tasks, a method to permit monitoring of the process, the method comprising:  
displaying the factory process in real-time as a three-dimensional, free-camera, computer generated representation of the process as a whole; and  
10 selectively displaying each of the tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.

15 2. The method of claim 1 including selectively displaying data representative of a status of the displayed process.

3. The method of claim 1 including selectively displaying data representative of a status of one of the displayed tasks.

20 4. The method of claim 1 including selectively displaying data representative of a status a plurality of the displayed tasks.

5. The method of claim 1 wherein the process has a controllable parameter and the method includes controlling the parameter of the factory process.

25 6. The method of claim 1 wherein one of the tasks has a controllable parameter and the method includes controlling the controllable parameter of the task.

30 7. The method of claim 1 wherein a plurality of the tasks have a controllable parameter and the method includes selectively controlling the controllable parameter of each of the tasks.

- 5 8. The method of claim 1 wherein one of the tasks has a sub-task and the method includes selectively displaying the sub-task in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.
- 10 9. The method of claim 8 wherein the sub-task has a controllable parameter and the method includes controlling the controllable parameter of the sub-task.
- 15 10. The method of claim 1 wherein a plurality of the tasks has a respective plurality of sub-tasks and the method includes selectively displaying the sub-tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective sub-tasks.
- 20 11. The method of claim 10 wherein each of the sub-tasks has a controllable parameter and the method includes controlling the controllable parameter of the sub-tasks.
- 25 12. The method of claim 1 including:  
sensing a status of one of the tasks;  
determining if the sensed status is acceptable; and  
automatically displaying the task if the sensed status is not acceptable.
- 30 13. The method of claim 1 including:  
sensing a status of a plurality of the tasks; and  
determining if the sensed status of each of the plurality of tasks is acceptable; and  
automatically displaying one of the plurality of tasks if the sensed status of the  
one of the plurality of tasks is determined not to be acceptable.
14. For a factory process comprising a plurality of tasks, a method to permit monitoring of the process, the method comprising:

5 displaying the factory process in real-time as a three-dimensional, free-camera,  
computer generated representation of the process as a whole;  
selecting one of the tasks; and  
displaying data representative of a status of the selected one of the displayed  
tasks.

10 15. The method of claim 14 including displaying data representative of a status of a  
plurality of the displayed tasks.

15 16. The method of claim 14 wherein the process has a controllable parameter and the  
method includes controlling the parameter of the factory process.

17. The method of claim 14 wherein the one of the displayed tasks has a controllable  
parameter and the method includes controlling the controllable parameter of the  
task.

20 18. The method of claim 14 wherein the plurality of tasks has a controllable  
parameter and the method includes controlling the controllable parameter of each  
of the tasks.

25 19. The method of claim 14 wherein one of the tasks has a sub-task and the method  
includes selectively displaying the sub-task in real-time as a three-dimensional,  
free-camera, computer generated representation of the respective task.

30 20. The method of claim 19 wherein the sub-task has a controllable parameter and the  
method includes controlling the controllable parameter of the sub-task.

21. The method of claim 14 wherein a plurality of the tasks has a respective plurality  
of sub-tasks and the method includes selectively displaying the sub-tasks in real-

5 time as a three-dimensional, free-camera, computer generated representation of the respective sub-tasks.

22. The method of claim 21 wherein each of the sub-tasks has a controllable parameter and the method includes controlling the controllable parameter of the  
10 sub-tasks.

23. For a factory process comprising a plurality of tasks, a computer readable medium containing program instructions for execution by a processor to cause the processor to perform steps to permit monitoring of the process on a video display, the method comprising:  
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displaying the factory process in real-time as a three-dimensional, free-camera, computer generated representation of the process as a whole; and

selectively displaying each of the tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.  
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24. The method of claim 23 including selectively displaying data representative of a status of the displayed process.

25. The method of claim 23 including selectively displaying data representative of a status of one of the displayed tasks.  
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26. The method of claim 23 including selectively displaying data representative of a status a plurality of the displayed tasks.

27. The method of claim 23 wherein the process has a controllable parameter and the method includes controlling the parameter of the factory process.  
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28. The method of claim 23 wherein one of the tasks has a controllable parameter and the method includes controlling the controllable parameter of the task.

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29. The method of claim 23 wherein a plurality of the tasks have a controllable parameter and the method includes selectively controlling the controllable parameter of each of the tasks.

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30. The method of claim 23 wherein one of the tasks has a sub-task and the method includes selectively displaying the sub-task in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.

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31. The method of claim 30 wherein the sub-task has a controllable parameter and the method includes controlling the controllable parameter of the sub-task.

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32. The method of claim 23 wherein a plurality of the tasks has a respective plurality of sub-tasks and the method includes selectively displaying the sub-tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective sub-tasks.

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33. The method of claim 32 wherein each of the sub-tasks has a controllable parameter and the method includes controlling the controllable parameter of the sub-tasks.

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34. The method of claim 23 including:  
sensing a status of one of the tasks;  
determining if the sensed status is acceptable; and  
automatically displaying the task if the sensed status is not acceptable.

35. The method of claim 23 including:  
sensing a status of a plurality of the tasks; and  
determining if the sensed status of each of the plurality of tasks is acceptable; and

5 automatically displaying one of the plurality of tasks if the sensed status of the one is determined not to be acceptable.

36. A system for monitoring a factory process, the factory process comprising a plurality of tasks, a system comprising:

10 means for displaying the factory process in real-time as a three-dimensional, free-camera, computer generated representation of the process as a whole; and

means for selectively displaying each of the tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.

15 37. The system of claim 36 including means for selectively displaying data representative of a status of the displayed process.

38. The system of claim 36 including means for selectively displaying data representative of a status of one of the displayed tasks.

20 39. The system of claim 36 including means for selectively displaying data representative of a status a plurality of the displayed tasks.

40. The system of claim 36 wherein the process has a controllable parameter and the system includes means for controlling the parameter of the factory process.

41. The system of claim 36 wherein one of the tasks has a controllable parameter and the system includes means for controlling the controllable parameter of the task.

30 42. The system of claim 36 wherein a plurality of the tasks have a controllable parameter and the system includes means for selectively controlling the controllable parameter of each of the tasks.

- 5 43. The system of claim 36 wherein one of the tasks has a sub-task and the system includes means for selectively displaying the sub-task in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.
- 10 44. The system of claim 43 wherein the sub-task has a controllable parameter and the system includes means for controlling the controllable parameter of the sub-task.
45. The system of claim 36 wherein a plurality of the tasks has a respective plurality of sub-tasks and the system includes means for selectively displaying the sub-tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective sub-tasks.
- 15 46. The system of claim 45 wherein each of the sub-tasks has a controllable parameter and the system includes means for controlling the controllable parameter of the sub-tasks.
- 20 47. The system of claim 36 including:  
means for sensing a status of one of the tasks;  
means for determining if the sensed status is acceptable; and  
25 means for automatically displaying the task if the sensed status is not acceptable.
48. The system of claim 36 including:  
means for sensing a status of a plurality of the tasks; and  
means for determining if the sensed status of each of the plurality of tasks is  
30 acceptable; and  
means for automatically displaying one of the plurality of tasks if the sensed status of the one is determined not to be acceptable.

- 5 49. For a factory process comprising a plurality of tasks, wherein both the factory process and the tasks include controllable parameters, a method to permit monitoring and control of the process, the method comprising:
- displaying the factory process in real-time as a three-dimensional, free-camera, computer generated representation of the process as a whole;
- 10 selectively displaying data representative of a status of the displayed process;
- selectively controlling the factory process parameter;
- selectively displaying each of the tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective task;
- selectively displaying data representative of a status a plurality of the displayed
- 15 tasks; and
- selectively controlling the controllable parameter of each of the tasks
50. The method of claim 49 wherein one of the tasks has a sub-task and the method includes selectively displaying the sub-task in real-time as a three-dimensional, free-camera, computer generated representation of the respective task.
- 20 51. The method of claim 50 wherein the sub-task has a controllable parameter and the method includes controlling the controllable parameter of the sub-task.
- 25 52. The method of claim 50 wherein a plurality of the tasks has a respective plurality of sub-tasks and the method includes selectively displaying the sub-tasks in real-time as a three-dimensional, free-camera, computer generated representation of the respective sub-tasks.
- 30 53. The method of claim 52 wherein each of the sub-tasks has a controllable parameter and the method includes controlling the controllable parameter of the sub-tasks.
54. The method of claim 50 including:



5 sensing a status of one of the tasks;  
determining if the sensed status is acceptable; and  
automatically displaying the task if the sensed status is not acceptable.

55. The method of claim 50 including:

10 sensing a status of a plurality of the tasks; and  
determining if the sensed status of each of the plurality of tasks is acceptable; and  
automatically displaying one of the plurality of tasks if the sensed status of the  
one is determined not to be acceptable.